

Florence Nightingale's fever

D A B Young

It is a sad irony that Florence Nightingale (1820-1910), the founder of modern nursing, who made such important contributions to public health through her advocacy of sanitation, statistics, and common sense, should also be remembered as history's most famous invalid and possibly as its most successful malingerer. After her return from the Crimean war hospitals in 1856 she suffered several bouts of illness, and both she and her friends, medical and lay, thought she was dying. From August 1857, when she suffered her first major attack, until 1880 she was an invalid, spending much of her waking hours confined to a couch. An attack at Christmas 1861 left her unable to walk and she remained bedridden for six years.

The nature of the illness that afflicted this precise, energetic, and inquiring woman was not understood then, nor has it been satisfactorily elucidated since. After her death medical opinion favoured the diagnosis of neurasthenia,¹ an obsolete term denoting a symptom complex now associated with psychosomatic illness; retrospective diagnoses propose such a condition.^{2,3} This seems eminently reasonable from a review of the signs and symptoms of her illness: weakness, headache, nausea at the sight of food, breathlessness, tachycardia, palpitations, and precordial pain; furthermore, earlier in life she had a somewhat neurotic disposition.

Cope believed that after her superhuman efforts in both the Crimean war and the campaign for medical reform of the army (1856-7) Florence collapsed with a "stress" induced neurosis, but he was unable to explain why she did not recover.² Such a difficulty does not arise with Pickering's diagnosis of an anxiety neurosis resulting from Florence's unresolved conflict with her mother and her sister,³ since such a neurosis will, if left untreated, often continue indefinitely. Nevertheless, this diagnosis has grave deficiencies. Firstly, Florence's sister Parthenope married in the summer of 1858 and "henceforth Parthe and Fanny [her mother] left Florence alone"³—so why did Florence get worse and remain an invalid for at least another 20 years? Secondly, anxiety, regardless of its cause, manifests a disturbance of intellectual power: "the anxious patient is unable to think clearly and to use proper judgment, to learn efficiently, or to remember accurately."⁴ No description could be more at variance with the formidable powers of the Florence Nightingale of those years of illness, 1857-68.

Importance of a satisfactory diagnosis

A more satisfactory diagnosis must be sought for two reasons. Firstly, Florence's behaviour in those years of illness prejudiced severely her reputation and achievements for later generations. When she arrived back in England in August 1856, Florence was a changed woman. Her family and friends were dismayed at her gaunt appearance (fig 1), but the change in her personality was even greater. She was gloomy, agitated, and obsessive. Over the next decade she dedicated her life to improving public health and founding modern nursing; but though her aims were loving and humanitarian, as they had been in the Crimea, her personal relationships were cold at best and at worst appallingly heartless, and she maintained



Fig 1—Florence on her return from the Crimean war. Thin, exhausted, and aged, she was scarcely recognisable to her family and friends

a cruel, tyrannical, and reproachful attitude to the relations, friends, and allies who were closest to her.

The second reason is that biographers, influenced by this personality change and the lack of a diagnosis of an organic illness, have commented on the way she used her illness to further her work and influence^{5,6}; some suggest that she was malingering.^{3,7} With such scepticism endorsed by medical opinion, it is no wonder that the historian F B Smith maintained that she lied about her health for her own ends and used this premise as a major element in his savage and destructive attack on her character, reputation, and achievements.⁸

To settle this biographical conflict it is essential to establish whether an organic illness could account for Florence Nightingale's invalidism. The dreadful change in her which was apparent on her return to England in 1856 suggests that she had contracted a serious and debilitating chronic disease in the course of her service in the east. There was just such an occasion: her fever.

Florence succumbs to Crimean fever

On 2 May 1855 a tired but healthy Florence Nightingale, 10 days short of her 35th birthday, left Scutari for the Crimea to inspect the hospitals at Balaclava. She arrived there on 5 May and on 12 May was taken ill. "Dr Anderson, the Chief Medical Officer at the General Hospital in Balaclava . . . called others of the medical staff into consultation, and a joint

23 Hillcrest, Downham
Market, Norfolk PE38 9ND
D A B Young, formerly
principal scientist, Wellcome
Foundation

BMJ 1995;311:1711-4

bulletin was issued to the effect that Miss Nightingale was suffering from Crimean fever."¹ Her condition grew worse; and she was taken to hospital, delirious and very ill. "She is suffering," said Dr Anderson, "from as bad an attack of fever as I have seen."⁹ Over the next two weeks her condition varied between satisfactory and critical: a sudden relapse in the morning, recovery, and then another relapse in the evening.⁹ By 24 May she was out of danger, but her recovery was slow and her weakness great. For some weeks she was unable to feed herself or speak above a whisper.¹

She returned to Scutari in July, arriving there emaciated, white faced, extremely weak, and looking much older than her age. She was still convalescing in late August. At the beginning of October she returned to the Crimea to complete her work, but was admitted to hospital for a week with severe sciatica. She wrote: "I have now had all that this climate can give, Crimean fever, Dysentery, Rheumatism." At the end of November she returned to Scutari. By the close of 1855 she had earache, continual laryngitis, and insomnia and was obsessed by failure.

Another recorded case of Crimean fever at that time was assistant surgeon George Lawson.¹⁰ He developed Crimean fever and was admitted to hospital on 6 May 1855 by Dr Anderson, who six days later diagnosed the same disease in Miss Nightingale's case. The condition of the two patients gave cause for anxiety for a fortnight, after which they both needed a long period of convalescence. He was invalided home in July. On the voyage, Lawson suffered a relapse, a polyneuritis resulting in paralysis of both legs and to some degree of his hands. Whereas he had recovered quickly and uneventfully from a serious attack of typhoid at Varna in August 1854, this attack of Crimean fever was an illness lasting five months, and its consequences remained with him for the rest of his life: a weak heart and an impaired circulation. Despite a weakened constitution, he enjoyed a long and distinguished career as a general and ophthalmic surgeon; he died in 1903 aged 71.^{10 11}

Crimean fever and Malta fever

Six forms of fever were encountered by the British Army in the Crimean war.¹² Of these, typhoid was undoubtedly the most important, and the most fatal, with typhus second. The two diseases were adequately described and differentiated in Lyons and Aitken's report (1856).¹² Army doctors, fully cognisant of William Jenner's work, were confident in their differential diagnosis of typhoid and typhus and in distinguishing them from the third important fever, remittent fever.¹³ This last "became popularly known by the name of 'Crimean' Fever."¹² It was characterised by nervous irritability (feverish excitement and delirium) and prolonged gastric irritation. Remission, from which it derives its name, could be decided: two periods of exacerbation (morning and evening), with complete remissions, in 24 hours. The course of the affection was extremely irregular, often protracted, and relapse was common.¹² Although seldom directly fatal, it was a serious malady because of the consequent debility and months of convalescence required.

So "Crimean fever" was "remittent fever"; but what is remittent fever (also called Malta or Mediterranean fever)? Today this disease is included under the generic name brucellosis. Marston's detailed description of the disease (1861) confirms the essentials supplied by Lyons and Aitken, but adds much more, including prevalence in spring, tachycardia, depression, and restlessness.¹³ The patient rarely recovers without suffering from rheumatism or some form of neuralgia; thus, "just as the unfortunate patient flatters himself

that all is well, he will, with all suddenness, get an excruciating attack of sciatica."

David Bruce identified the causal agent in 1887, a bacterium now termed *Brucella melitensis*. Hughes, in the first monograph on brucellosis, noted the plethora of names for the disease, reflecting its widespread prevalence around the Mediterranean.¹⁴ He emphasised the anaemia, breathlessness, debility, cachexia, and aging that may follow the initial illness. In 1905 Zammit identified goats as the reservoir of the infection, the disease being transmitted through milk and milk products. Lawson had written in a letter home at the end of March 1855, a month before going down with Crimean fever: "I am daily expecting the arrival of a goat which I have ordered to be purchased for me, for the purpose of supplying me with fresh milk every morning. I have not tasted milk since I have been in the Crimea and intend soon to enjoy this luxury."¹⁰

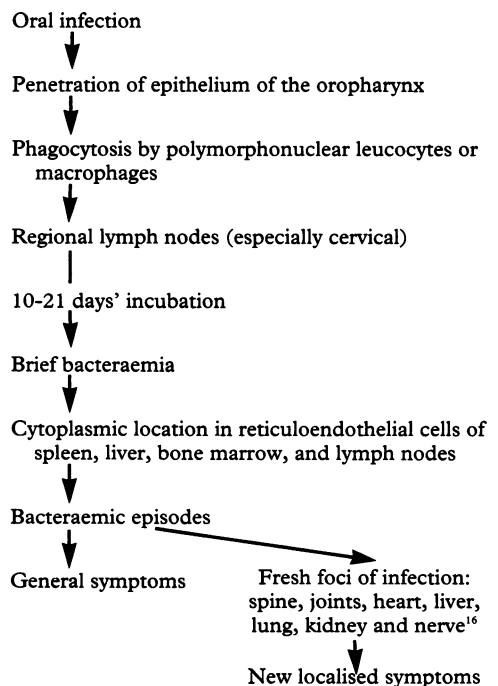
Because the incubation time of Malta fever is between 10 days and a month, Miss Nightingale was certainly infected in the Constantinople area. Hughes remarked on the high incidence of the fever there.¹⁴

Brucellosis

Brucellosis is a disease caused by bacteria of the genus *Brucella*. The course of the disease varies with the causative species. *B. melitensis*, the agent of Malta fever, is the most invasive and virulent of the genus, and the resulting illness may be followed, months or even years later, by serious complications.¹⁵ This remarkable persistence is readily understood from the behaviour of the organism in the body, where it becomes an intracellular parasite (box 1).

Chronic brucellosis takes two forms (box 2).¹⁷ The first form has long been recognised, but the second, in which there are no distinctive symptoms and the differential diagnosis from neurosis may be difficult, was disputed. Its full recognition stemmed from the experiences of Dr Alice Evans (1881-1975), a distinguished bacteriologist who in 1918 established the close relation between the causal agents of Malta fever in humans and abortion fever in cattle. These agents were later renamed *B. melitensis* and *B. abortus* respec-

Box 1—*Brucella melitensis* in the human host



Box 2—Chronic brucellosis

The term chronic brucellosis applies where the illness persists for more than a year. It takes two forms.¹⁷

- In the specific form, distinctive symptoms and signs can be accurately ascribed to the late effects of brucellosis. Symptoms of the nervous and skeletal systems are the most important, especially in Malta fever (*B melitensis*)

"*Neurobrucellosis*": myelitis, radiculitis, sciatica, neuritis, neuralgia (facial, cervical, intercostal, etc), and vasomotor disturbances.¹⁹ "The terrific impact [brucellosis] has on the nervous system, both central and autonomic . . . is probably the most significant feature of the disease"²⁰

Bones and joints: arthralgia (almost any joint may be affected, most frequently the large, especially hip, knee, and sacro-iliac); spondylitis (high incidence, often results in permanent disability, usually involves lumbar vertebrae, and often leads to radiculoneuritis and severe paraparesis);^{20,21} "Brucella spondylitis is one of the most incapacitating and painful maladies that can affect man"²⁰

- In the non-specific form there are no such distinctive symptoms but many general complaints, which makes the differential diagnosis from neurosis very difficult. However, the symptoms mirror many of those experienced in the acute and convalescent phases of Malta fever

Insomnia, anorexia, nausea at sight of food, anaemia, nervousness, depression, delusions, tachycardia, palpitations, syncope, dyspnoea, weakness, indigestion, flushing, headache, nervous tremors

Severe depression, frustration, and nervousness (gross tremors of hands and fingers, irritability, and emotional instability) are not distinctive symptoms, although related to "neurobrucellosis." But the longer the disease is active, the more deeply entrenched they become; and in people with a neurotic tendency, brucellosis may have serious repercussions on affect and personality^{17,22}

tively. While working with cultures of *B melitensis* she unwittingly became infected. Nearly six years of ill health followed, diagnosed throughout as neurasthenia. Finally, the organism was cultured from her blood.¹⁸ She suffered recurrent episodes of chronic brucellosis for a further 17 years. Like Florence Nightingale, Alice Evans lived to an advanced age.

Florence and chronic brucellosis

After her return from the Crimea, Florence suffered from a variety of symptoms (box 3) entirely consistent with a form of chronic brucellosis. The symptoms were especially intense in five attacks, when she and others thought she might die. These attacks were presumably general reactions to bacteraemic episodes. This explains why the non-specific symptoms mirror many

Box 3—Florence Nightingale's illness after her return to England

- 1856-7—Insomnia, anorexia, nausea at the sight of food, anaemia, and nervousness; also depression, which lasted for much of the subsequent 25 years

- August 1857—First severe attack with exacerbation of these symptoms together with delusions, tachycardia, and palpitations

- August 1859—Second severe attack, with additional symptoms of syncope, dyspnoea, weakness, indigestion, and flushing of face and hands

- 1861—Three further attacks; in the last she developed nervous tremors

- End of 1861—Serious attack with new symptoms: unable to walk (possibly radiculitis with consequent severe paraparesis), bedridden for 6 years; severe spinal pain (spondylitis) 1863-6; arthralgia (right elbow) and dyspnoea due to chest pains and spasms (possibly arthralgia of costochondrial joints, or muscle spasms linked to spondylitis)

- After 1870 most of these symptoms disappeared but severe headache and insomnia still plagued her life; her depression continued unabated, with feelings of worthlessness and failure

- After 1880 her depression lifted and other symptoms ceased

that the patient experiences in the initial infection.

In December 1861 she became seriously ill again, but the symptoms of this and subsequent attacks were those of the specific form of chronic brucellosis. Thus she was unable to walk and had to be carried to and from her bed. Her doctors diagnosed "congestion of the spine, which leads straight to paralysis." She was bedridden for the next six years. She complained bitterly over the years 1863-6 of spinal pain, almost certainly due to spondylitis. It was especially bad in the first half of 1866 and could be so severe that she was unable to have her position changed for 48 hours at a time. It was eventually relieved by subcutaneous opium.



Fig 2—Florence Nightingale in old age, stout and happy

Miss Nightingale's old age

After the age of 60 Florence's depression—the last symptom of her illness—lifted, and she was able to resume something like normal relationships with relatives and friends. Gone was the cold, obsessed tyrant who rejected as inadequate the devoted services of her closest allies, even the dedicated Sidney Herbert, whom she had dismissed as a disloyal deserter because he was dying. But it was too late to change her life. Although she was now ambulant and occasionally went for walks, she continued her solitary, confined routine, habituated by years of painful complications of her illness. As her character blossomed into benevolence, the thin, emaciated, mature woman became a dignified, stout, old lady with a large, good humoured face (fig 2). In 1884 her sight began to fail and in 1901 she became totally blind. Her mind was also failing, and for the last five years of her life she was scarcely aware of her surroundings.

Conclusions

Cope explicitly states, and Pickering implicitly assumes, that Florence had no organic disease to account for her illness.²³ This was the justification for the diagnosis of psychoneurosis, but Alice Evans's case shows how hazardous this argument is.²³ The test for brucella serum agglutinins had negative results, so the diagnosis was neurasthenia. The test was

still negative some years later, when brucellae were cultured from her blood, a circumstance that is not unique.¹⁵

Today, with chemotherapy, chronic brucellosis and serious complications are rare.¹⁶ But if it was chronic brucellosis that condemned Florence to a lifetime of confinement and pain, it might be asked whether anything known now could have helped. It is ironic that, of the current therapeutic recommendations, the only one available to Florence's doctors was to advise the patient to rest.²² This advice was given and she followed it for 25 years; and nothing in her entire life has generated more censure from her recent biographers.

Alice Evans noted that some patients with proved chronic brucellosis reported long delays before the correct diagnosis was made, and that the interim diagnosis was almost invariably neurasthenia.²³ Florence Nightingale's case has been the same, although a delay of 140 years seems excessive.

1 Cook E. *The life of Florence Nightingale*. London: Macmillan, 1913.

2 Cope Z. *Florence Nightingale and the doctors*. London: Museum Press, 1958.

3 Pickering G. *Creative malady*. London: Allen and Unwin, 1974.

4 McHugh PR. Anxiety. In: Wyngaarden JB, Smith LH, eds. *Cecil textbook of medicine*. 16th ed. Philadelphia: Saunders, 1982:1991-3.

5 Goldsmith M. *Florence Nightingale: the woman and the legend*. London: Hodder and Stoughton, 1937.

6 Woodham-Smith C. *Florence Nightingale*. London: Penguin Books, 1955.

7 Longford E. *Eminent Victorian women: Florence Nightingale*. London: Weidenfeld & Nicolson, 1981:85-108.

8 Smith FB. *Florence Nightingale: reputation and power*. London: Croom Helm, 1982.

9 Soyer A. *Soyer's culinary campaign*. London: Routledge, 1857.

10 Lawson G. *Surgeon in the Crimea: the experiences of George Lawson recorded in letters to his family 1854-1855*. London: Constable, 1968.

11 [Obituary of George Lawson FRCS]. *Lancet* 1903;iii:1184-5.

12 Lyons RD, Aitken W. *Reports of commissioners*. Vol 3. *Army (health). Report on pathology of diseases of the army in the east: fevers*. London: HMSO, 1857:54-83. (House of Commons Parliamentary Papers.)

13 Marston JA. Report on fever (Malta). In: *Army Medical Department Reports 1861*. Vol 3. London: HMSO, 1863:486-521.

14 Hughes ML. *Mediterranean, Malta or undulant fever*. London: Macmillan, 1897.

15 Dalrymple-Champneys W. Undulant fever, a neglected problem. *Lancet* 1950;ii:429-35, 477-85.

16 Buchanan TM. Brucellosis. In: Wyngaarden JB, Smith LH, eds. *Cecil textbook of medicine*. 16th ed. Philadelphia: Saunders, 1982:1535-7.

17 Christie AB. *Infectious diseases: epidemiology and clinical practice*. 4th ed. Edinburgh: Churchill Livingstone, 1987:1130-58.

18 Ramsay AM, Emond RTD. *Infectious diseases*. London: Heinemann, 1967: 208-16.

19 Nelson-Jones A. Neurological complications of undulant fever. *Lancet* 1951;i:495-8.

20 Spink WW. *The nature of brucellosis*. Minneapolis: University of Minnesota Press, 1956.

21 Ganado W. Human brucellosis, some clinical observations. *Scot Med J* 1965;10:451-60.

22 Spink WW. Brucellosis. In: Cecil RL, Loeb RF, eds. *Textbook of medicine*. 10th ed. Philadelphia: Saunders, 1959:226-31.

23 Evans AC. Chronic brucellosis. *JAMA* 1934;103:665-7.

Excessive impertinence or a missed diagnosis?

Timothy M Williams, Kim, Gareth Williams

In 1885 Gilles de la Tourette described a striking syndrome of motor and verbal tics, with uncontrollable gesticulations and verbal outbursts, especially of a profane or scatological nature (coprolalia).¹ As currently defined, Tourette's syndrome encompasses several neurological disorders, including echolalia and palilalia (invented words), obsessive-compulsive behaviour, and occasionally self mutilation.² Subjects often have a fascination with rhymes, riddles, and word play.^{3,4} Interestingly, Tourette's syndrome has been linked with artistic creativity, and there has been speculation that Mozart and Dr Samuel Johnson may have been sufferers.^{4,5} We believe that Tourette's syndrome could also underlie the bizarre and hitherto unexplained behaviour of one of the best known yet most enigmatic characters of 20th century English literature.

Case report

The case of SN, a male red squirrel (*Sciurus vulgaris leucourus*) of indeterminate age, was reported in detail by Potter.⁶ SN came from an extensive family with no apparent history of neurological or other disease. He is described as "excessively impertinent in his manners" and was a source of great embarrassment to his family and of nearly fatal irritation to the local owl, a noted carnivore. He contrasts sharply with his peers, who were placid, well behaved, and content in their pursuit of normal squirrel activities such as collecting nuts, fishing, constructing rafts, etc.

The overwhelming impression of SN is of boundless energy and extreme motor, vocal, and cognitive restlessness. He was evidently in constant motion, and has been described as dancing, skipping, and "bobbing up and down like a little red cherry" (figure). SN's vocalisations ranged from inappropriate singing, laughing, shouting, and chanting rhymes and riddles to whirring noises and a curious chattering ("Cuck-cuck-cuck-cur-r-r-cuck-k-k"). He used frequent neologisms, such as "Hitty-pitty" (for nettle), and

seemed to be particularly fond of rhythmic refrains (Hum-a-bum! buzz! buzz! Hum-a-bum buzz!). While the other squirrels foraged for food and were being deferential to the owl, SN indulged in solitary activities such as repetitive toying with pine needles and playing marbles or ninepins.

During the six days covered by the report, his motor and vocal behaviours became increasingly erratic and included taunting the owl verbally and tickling him with a nettle. These culminated in an impetuous leap on to the owl, an act that cost SN half his tail and almost his life. Long term follow up of SN is not provided, but it is clear from the end of the case history that his behaviour remained abnormal long after this episode.



SN in characteristic pose. Note motor tics, impression of incessant movement, and torticollis. © F Warne & Co, 1903, 1987

Department of Medicine,
Royal Liverpool University
Hospital, PO Box 147,
Liverpool L69 3BX
Timothy M Williams, junior
research associate
Kim, wildlife expert
Gareth Williams, professor of
medicine (diabetes and
endocrinology)

Correspondence to:
Professor Williams.

BMJ 1995;311:1714-5